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Solar Still For Survival Water

Parched desert soils can yield enough water for emergency survival with a pocket model "solar still" developed by scientists of USDA's Agricultural Research Service.

A six-foot-square plastic sheet, a container to catch water, and some elbow grease are all that's required to make the still, an outgrowth of basic research by the Soil and Water Conservation Research Division of ARS. A shovel and some plastic tubing, while not absolutely necessary, would make the still easier to construct and more convenient to operate.

The still, which is made by covering a small pit with the plastic film, uses the two most abundant resources of the desert: sun and soil. As much as two or three pints of water can be obtained daily. Two of these stills should produce enough water to keep a man alive indefinitely.

This same technique can be used to obtain drinking water from ocean beaches or other places with moist soil but no fresh water.

Photos on this and the following pages show a step-by-step method for constructing the solar still.



A drink of water on the desert is usually available a few hours after the solar still has been completed. The plastic tubing allows drinking without disturbing the still.

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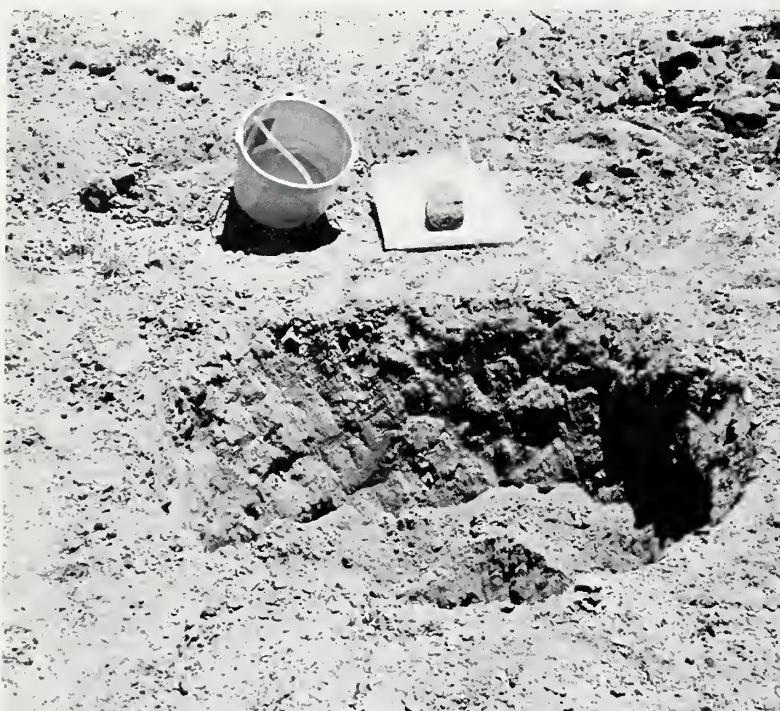
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Digging a hole is the first step in the construction of a solar still. It should be about 40 inches in diameter and have sloping sides with a central depth of 18 to 20 inches. If a shovel isn't available, soil can be loosened with a sharp rock and scooped out by hand.



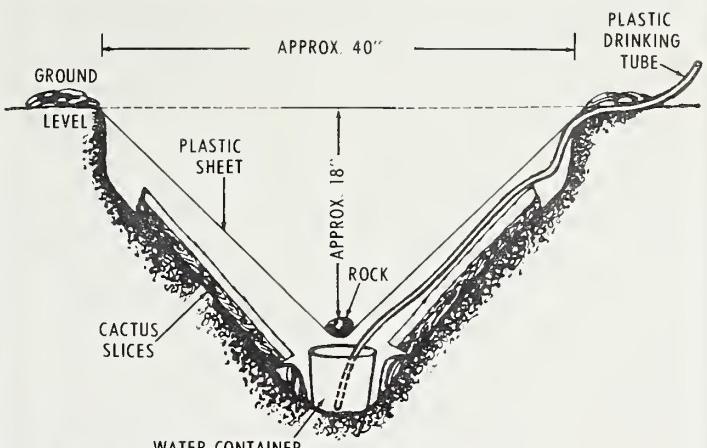
All that is needed to make a solar still is shown beside the hole: a bucket to catch the water (shaped aluminum foil or a large can would do); a plastic drinking tube; a sheet of plastic; and a rock. Output of the still can be increased by cutting cacti or other fleshy plants into chunks and placing them in the hole.

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HOW THE SOLAR STILL WORKS

The above diagram shows a side view of the solar still. Sunlight shining through the plastic heats the area underneath, vaporizing the moisture in the soil and plant material. As soon as the air inside the still becomes saturated, water vapor condenses on the underside of the plastic cover. The droplets thus formed run down the plastic and into the water container. The plastic should be of a "wettable" type so that water will cling to it and not drop off before running to the lowest point. The water container should be wide enough to catch all drops.

About one hour is required for droplets to start to form on the plastic after the still is completed. It will then produce continually through the day and for a short time in the evening. Moist soil will yield about three pints of water a day, but if the soil is very dry, fleshy plant material will be needed to produce a two to three pint yield. Polluted water can be purified by pouring it on the soil under the plastic.

There are more efficient solar stills—some of them available commercially—but none as inexpensive or as easy to construct.

The water container is placed in the bottom of the hole, with the drinking tube leading from the container over the rim of the hole. Cactus chunks have been placed on the sloping sides.



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The sheet of plastic is placed over the hole, and fastened at the edges with piles of soil. A rock is placed in the center to form an inverted cone with the plastic. The sides of the cone must not touch the soil and the bottom must not be in contact with the water container.

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